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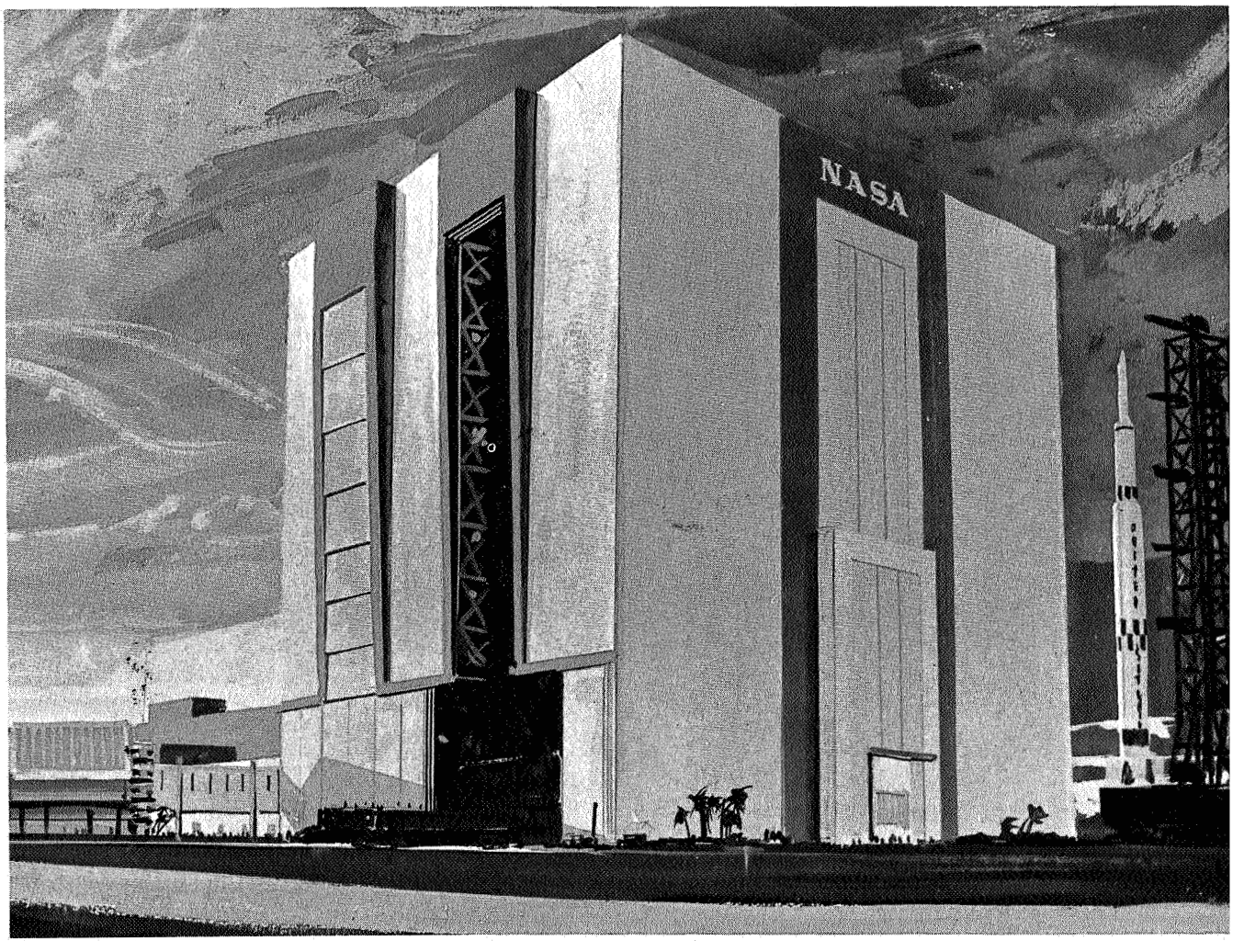
JOHN F. KENNEDY SPACE CENTER

Cocoa Beach, Florida

FACT SHEET

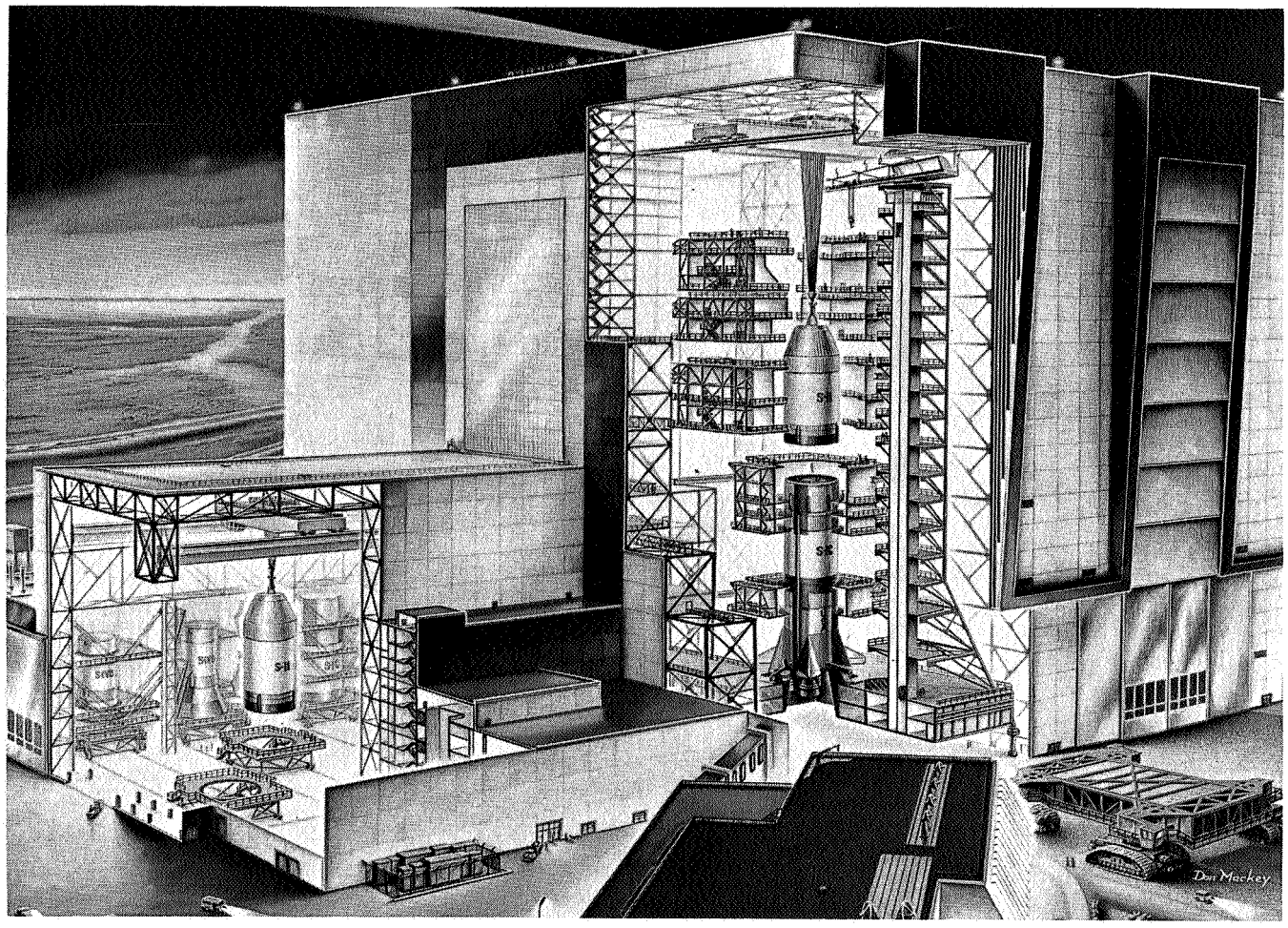
VEHICLE ASSEMBLY BUILDING (VAB)



Launch Complex **39,** the key segment of the nation's first operational spaceport at NASA's John F. Kennedy Space Center, Merritt Island, will accommodate the Apollo/ Saturn V moon vehicle.

The major components of Launch Complex **39** include: **(1)** the Vehicle Assembly Building, where the space vehicle is assembled and prepared; **(2)** the Mobile Launcher, upon which the vehicle is erected for checkout, transfer, and launch and which provides internal access to the vehicle and spacecraft; **(3)** the Crawler-Transporter, which transfers the vehicle to the launch area; (4) the Crawlerway, upon which the Crawler-Transporter travels to the launch site; (5) the Mobile Servicing Structure, which provides external access to the vehicle at the launch site; and **(6)** the launch pedestal, from which the space vehicle is launched.

The Vehicle Assembly Building (VAB), the most impressive building at the spaceport, consists of a high-bay area **525** feet tall, and a low-bay area **210** feet tall, and a four story launch control center (LCC) which is connected to the high bay by an enclosed bridge. When completed, the VAB will be the world's largest building in volume and will occupy eight acres of land. There are four vehicle assembly and checkout bays in the high-bay area. The low-bay area contains eight stage-preparation and checkout cells equipped with systems to simulate stage interface. The LCC houses display, monitoring, and control equipment for checkout and launch operations. Each of four control rooms will be equipped to check out and launch a complete vehicle.



Rocket stages are shipped by barge from fabrication centers to a turning basin near the VAB, off-loaded onto special carriers and transported to the building. The booster stage is towed to the high-bay area and erected on the Mobile Launcher. Four holddown-support arms on the platform secure the booster in place. Work platforms are positioned around the stage and it is inspected and tested. Concurrently, upper stages are delivered to the low-bay area, inspected, and tested.

When testing of individual stages is complete, the upper stages are prepared for mating and moved to the high-bay area, as is the Apollo spacecraft after undergoing tests at the spaceport's Manned Spacecraft Operations Building. All major sections of the Apollo/Saturn V are vertically assembled in the high-bay area. The assembled vehicle then undergoes final integrated checkout, including retraction of all umbilical arms, and an electronically simulated flight.

The Vehicle Assembly Building, though relatively simple and conventional in construction, invited some unique design problems by its size.

When the Apollo/Saturn V and the Mobile Launcher are carried by the Crawler-Transporter from the VAB, they will leave through an inverted-T opening 456 feet high. The base of the opening is 149 feet wide and 113 feet high; the remainder is 76 feet wide. There are four such openings in the VAB, one for each of its four bays. To maintain the protective environment of the building, doors had to be designed for these huge openings--doors that could withstand winds of 125 miles per hour and could be opened and closed in a 63 mile-per-hour wind.

As designed, a series of 49-foot-high panels, stacked at the top of the opening, lower sequentially to cover the vertical segment of the exit. Then four, conventional, wheel-driven doors located below move horizontally to cover the base of the opening.

There are 141 lifting devices in the VAB, ranging from 1-ton mechanical hoists to 250-ton, high-lift, bridge cranes. The two, 250-ton cranes serve the four assembly and checkout bays in the high-bay section of the building. These cranes, whose lifting height is 456 feet and whose travel distance is 431 feet, have several distinct design features.

They are designed to support their full load, without using brakes, for 30 minutes. When supported, the load may not lower more than 0.1 foot per minute, a rate not discernible by the eye. This close tolerance is required for proper mating of Saturn V stages and the Apollo spacecraft. In addition, each crane has a double drive system, each drive. being independent of the other. The bridge of the crane is made of high-strength steel.

Work-platform halves, mounted on opposite walls in the high-bay area, are designed to move in and out like suspended file drawers, mating to form buildings--some three stories high--encircling the space vehicle. Platforms extend or retract in less than 10 minutes. Each platform half is suspended by two wheels, which are driven by electric motors, and two follower wheels. Twenty-ton hydraulic jacks in the follower-wheel housings are used to align platform halves. These jacks pivot the platform half around the drive wheels. Because of the long moment arm from drive wheels to mating surfaces, only 1.5 inches maximum jack travel is needed for alignment of platform halves.

Max Urbahn, who headed the design team of architects and engineers for the Vehicle Assembly Building stated the design challenge well when he said:

"The VAB is not so much a building to house a moon vehicle as a machine to build a moon craft. The Launch Control Center that monitors and tests every component that goes into an Apollo vehicle is not so much a building as an almost-living brain."

LEADING PARTICULARS

Vehicle Assembly Building

Overall Length	716 feet 6 inches
Overall Width	518 feet
Height	525 feet 10 inches
Volume	129,482,000 cubic feet
Imprint Area	343,500 square feet
Low Bay	
Length	274 feet 6 inches
Width	442 feet
Height	210 feet 4 inches
Volume	12,282,000 cubic feet
Imprint Area	117,600 square feet
High Bay	
Length	442 feet
Width	518 feet
Height	525 feet 10 inches
Volume	117,200,000 cubic feet
Imprint Area	225,900 square feet

Launch Control Center

Type	4 story, rectangular
Length	181 feet
Width	378 feet
Height	76 feet